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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,890	08/28/2003	Shinichi Suzuki	81707.0187	9585
26021	7590	11/18/2004		
HOGAN & HARTSON L.L.P. 500 S. GRAND AVENUE SUITE 1900 LOS ANGELES, CA 90071-2611				
EXAMINER MAYES, MELVIN C				
ART UNIT		PAPER NUMBER		
1734				

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

MK2

**Office Action Summary**

Application No.

10/652,890

Applicant(s)

SUZUKI ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-11,14-20,22-24 and 27-30 is/are rejected.
- 7) ☒ Claim(s) 8,12,13,21,25 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/22/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

(1)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(2)

Claims 1, 5, 7, 9, 10, 14, 18, 20, 22, 23, 27, 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Enloe et al. 4,920,640.

Enloe et al. disclose a method of making a making a electronic substrate comprising: providing ceramic green sheets; punching vias in the green sheets and filling the holes with metal powder; depositing metal circuit patterns on the green sheets; laminating green sheets; and hot pressing (sintering). The metal powder can be placed in the vias by forming metal powder containing sheets of metal powder and organic binder, punching the via in the ceramic green sheet, placing the metal powder containing sheet against the green sheet and forcing the metal containing material into the via in the green sheet by punching. If a surface cavity is desired in the substrate, a hole can be punched in the green sheet which will reside on the surface of the substrate and the hole filled with BN tape material (sheet) of similar thickness by the same process as that for the metal sheet prior to lamination of the green sheets. The BN does not sinter during hot pressing and is removed after hot pressing. The ceramic of the green sheets can be

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AlN which is hot press sintered at 1900°C (col. 5, line 39 – col. 6, line 13, col. 9, line 25 – col. 10, line 42).

(3)

Claims 14, 18, 20, 22, 23, 27 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Heinss 3,768,144.

Heinss disclose a method making a ceramic composite comprising: providing a ceramic green sheet and a different green sheet made of metal or of a ceramic different from that of the ceramic green sheet, the two sheet having substantially the same thickness; laminating the green sheets; and simultaneously punching the green sheets from the side of the different green sheet so that a piece of the different green sheet transfers to and is lodged in the ceramic green sheet; screen printing the ceramic green sheet; joining two green sheets; and firing. The ceramic green sheet can be ceramic such as alumina with tungsten as the metal and with firing at 1650°C. Heinss disclose that substantial portions of material melting at temperature below that for firing can be combined with sufficient amount of higher melting metal so that the metallic portions of the structure maintain shape during firing and do not bead up or run out of the piece, such as molybdenum impregnated with a lower melting metal (col. 1-5).

(4)

Claims 14, 15, 17, 22-24 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Fleming et al. 5,239,744.

Fleming et al. disclose a method of making a multilayer magnetic component comprising: providing a non-magnetic ceramic green tape layer; providing a tape of removable material containing a region of magnetic material, the removable material being one which dissipates

prior to completion of sintering such as particles of polyethylene or graphite mixed with organic binder and being of equal thickness to the ceramic green tape layer; overlying the tape of removable material onto the ceramic green tape layer; punching the tape so that a layer of magnetic region and removable material is inserted into the ceramic green tape layer; printing conductors on the ceramic green tape layer; stacking layers; and firing at 800-1500°C. Fleming discloses that a layer 51 of the stack comprises a non-magnetic ceramic tape with an insert of removable tape material. Fleming further discloses that instead of printing conductors on the non-magnetic ceramic green tape layers, removable material inserts can be used to form the desired configuration of the conductive elements with back filling with molten metal after the removable material is eliminated during sintering (col. 2, line 23 – col. 6, line 42).

***Claim Rejections - 35 USC § 103***

(5)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(6)

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heinss 3,768,144.

Heinss disclose that for the green sheet made of metal, substantial portions of metal material melting at temperature below that for firing can be combined with sufficient amount of higher melting metal so that the metallic portions of the structure maintain shape during firing and do not bead up or run out of the piece, such as molybdenum impregnated with a lower melting metal.

Providing the metal green sheet with portions of metal material melting at temperature below that for firing and higher melting metal in the range as claimed would have been obvious to one of ordinary skill in the art to provide substantial portions of lower melting material yet provide metallic portions that maintain shape during firing and do not bead up or run out.

(7)

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming et al. 5,239,744.

Fleming et al. disclose providing the tape of removable material as being one which dissipates prior to completion of sintering such as particles of polyethylene or graphite mixed with organic binder.

Providing the polyethylene particles of average particle size in the range of 1-20 microns, as claimed, would have been obvious to one of ordinary skill in the art to provide particles of sufficient size to form a tape of removable material.

(8)

Claims 1-5, 10, 11, 14-18, 23, 24 and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al. 6,231,707 in view of IBM Technical Disclosure Bulletin, January 1990 and Fleming et al. 5,239,744.

Gupta et al. disclose a method of making a multilayer ceramic substrate comprising: punching vias in ceramic green sheets; filling a plurality of the vias with conducting paste; filling some of the vias with a fugitive material paste that burns off during sintering; stacking green sheets; and sintering (col. 2-4).

IBM Technical Disclosure Bulletin teaches that a dry process for filling vias in green sheets which eliminates smears that cause electrical shorts and incomplete filling comprises punching vias in the green sheet, locating the punched hole beneath a green sheet of metallizing composition and punching the metal green sheet to fill the hole in the ceramic green sheet.

Fleming et al. teaches that in making a multilayer ceramic component having free space, the free space can be provided by providing and punching a tape of removable material which dissipates prior to completion of sintering such as particles of polyethylene or graphite mixed with organic binder and being of equal thickness to the ceramic green tape layer (col. 3, lines 15-24).

It would have been obvious to one of ordinary skill in the art to have modified the method of Gupta et al. for making a multilayer ceramic substrate by using a dry process for filling the punched vias with conductive material and fugitive material, as taught by IBM Technical Disclosure Bulletin, to eliminate smears that cause electrical shorts and incomplete filling, and as taught by Fleming et al., to provide free space in a multilayer ceramic component. The use of a green sheet of metallizing composition and a tape of removable (fugitive) material, to fill the punched vias by placing the metallizing green sheet and fugitive material tape on the ceramic green sheet and punching to fill the vias would have been obvious to one of ordinary skill in the art as an alternative to the use of conductive paste and fugitive material paste to fill vias, as taught by IBM Technical Disclosure Bulletin and Fleming et al.

Providing the polyethylene particles of average particle size in the range of 1-20 microns, as claimed in Claims 3 and 16, would have been obvious to one of ordinary skill in the art to provide particles of sufficient size to form a tape of removable material.

Sintering the stacked green sheets at temperatures in excess of 1100°C or not higher than 1050°C, as claimed in Claims 10, 11, 23 and 24, would have been obvious to one of ordinary skill in the art as dependent on the ceramic of the green sheets and as low temperature and higher temperature firing ceramics are well known in the art.



(9)

Claim 6 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claims 5 and 18 above, and further in view of Heinss 3,768,144.

Heinss disclose that for the green sheet made of metal, substantial portions of metal material melting at temperature below that for firing can be combined with sufficient amount of higher melting metal so that the metallic portions of the structure maintain shape during firing and do not bead up or run out of the piece, such as molybdenum impregnated with a lower melting metal.

It would have been obvious to one of ordinary skill in the art to have provided the metallizing green sheet with portions of metal material melting at temperature below that for sintering and higher melting metal in the range as claimed, as taught by Heinss, to provide substantial portions of lower melting material yet provide metallic portions that maintain shape during firing and do not bead up or run out.

*Allowable Subject Matter*

(10)

Claims 8, 12, 13, 21, 25 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

(11)

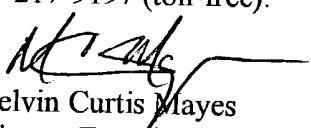
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(12)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
November 10, 2004